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Application No: 10584341 Version No: 1.0

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SEQUENCE LISTING

<110> MAURER, MARTIN
 FELDMANN, ROBERT E.
 KUSCHINSKY, WOLFGANG
 SCHNEIDER, ARMIN

<120> A PROCESS FOR IN VITRO DIFFERENTIATION OF NEURAL STEM
 CELLS OR OF CELLS DERIVED FROM NEURONAL STEM CELLS

<130> 085449-0198

<140> 10584341

<141> 2008-10-15

<150> PCT/EP04/014673

<151> 2004-12-23

<150> DE 10361444.3

<151> 2003-12-23

<160> 12

<170> PatentIn Ver. 3.3

<210> 1

<211> 781

<212> PRT

<213> Homo sapiens

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Ser Gly Ile His Ser Gly Ala Thr Thr Thr Ala Pro Ser Leu Ser Gly
 35 40 45

Lys Gly Asn Pro Glu Glu Glu Asp Val Asp Thr Ser Gln Val Leu Tyr
 50 55 60

Glu Trp Glu Gln Gly Phe Ser Gln Ser Phe Thr Gln Glu Gln Val Ala
 65 70 75 80

Asp Ile Asp Gly Gln Tyr Ala Met Thr Arg Ala Gln Arg Val Arg Ala
 85 90 95

Ala Met Phe Pro Glu Thr Leu Asp Glu Gly Met Gln Ile Pro Ser Thr
 100 105 110

Gln Phe Asp Ala Ala His Pro Thr Asn Val Gln Arg Leu Ala Glu Pro
 115 120 125

Ser Gln Met Leu Lys His Ala Val Val Asn Leu Ile Asn Tyr Gln Asp

130				135				140							
Asp 145	Ala	Glu	Leu	Ala	Thr	Arg	Ala	Ile	Pro	Glu	Leu	Thr	Lys	Leu	Leu
				150				155				160			
Asn	Asp	Glu	Asp	Gln	Val	Val	Val	Asn	Lys	Ala	Ala	Val	Met	Val	His
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Gln	Leu	Ser	Lys	Lys	Glu	Ala	Ser	Arg	His	Ala	Ile	Met	Arg	Ser	Pro
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Gln	Met	Val	Ser	Ala	Ile	Val	Arg	Thr	Met	Gln	Asn	Thr	Asn	Asp	Val
				195				200				205			
Glu	Thr	Ala	Arg	Cys	Thr	Ala	Gly	Thr	Leu	His	Asn	Leu	Ser	His	His
				210				215				220			
Arg	Glu	Gly	Leu	Leu	Ala	Ile	Phe	Lys	Ser	Gly	Gly	Ile	Pro	Ala	Leu
				225				230				235			
Val	Lys	Met	Leu	Gly	Ser	Pro	Val	Asp	Ser	Val	Leu	Phe	Tyr	Ala	Ile
				240				245				250			
Thr	Thr	Leu	His	Asn	Leu	Leu	Leu	His	Gln	Glu	Gly	Ala	Lys	Met	Ala
				255				260				265			
Val	Arg	Leu	Ala	Gly	Gly	Leu	Gln	Lys	Met	Val	Ala	Leu	Leu	Asn	Lys
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Thr	Asn	Val	Lys	Phe	Leu	Ala	Ile	Thr	Thr	Asp	Cys	Leu	Gln	Ile	Leu
				285				290				295			
Ala	Tyr	Gly	Asn	Gln	Glu	Ser	Lys	Leu	Ile	Ile	Leu	Ala	Ser	Gly	Gly
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Pro	Gln	Ala	Leu	Val	Asn	Ile	Met	Arg	Thr	Tyr	Thr	Tyr	Glu	Lys	Leu
				315				320				325			
Leu	Trp	Thr	Thr	Ser	Arg	Val	Leu	Lys	Val	Leu	Ser	Val	Cys	Ser	Ser
				325				330				335			
Asn	Lys	Pro	Ala	Ile	Val	Glu	Ala	Gly	Gly	Met	Gln	Ala	Leu	Gly	Leu
				340				345				350			
His	Leu	Thr	Asp	Pro	Ser	Gln	Arg	Leu	Val	Gln	Asn	Cys	Leu	Trp	Thr
				355				360				365			
Leu	Arg	Asn	Leu	Ser	Asp	Ala	Ala	Thr	Lys	Gln	Glu	Gly	Met	Glu	Gly
				370				375				380			
Leu	Leu	Gly	Thr	Leu	Val	Gln	Leu	Leu	Gly	Ser	Asp	Asp	Ile	Asn	Val
				385				390				395			
Val	Thr	Cys	Ala	Ala	Gly	Ile	Leu	Ser	Asn	Leu	Thr	Cys	Asn	Asn	Tyr
				400				405				410			
Lys	Asn	Lys	Met	Met	Val	Cys	Gln	Val	Gly	Gly	Ile	Glu	Ala	Leu	Val
				415				420				425			

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Arg Thr Val Leu Arg Ala Gly Asp Arg Glu Asp Ile Thr Glu Pro Ala					
450		455		460	
Ile Cys Ala Leu Arg His Leu Thr Ser Arg His Gln Glu Ala Glu Met					
465		470		475	480
Ala Gln Asn Ala Val Arg Leu His Tyr Gly Leu Pro Val Val Val Lys					
	485		490		495
Leu Leu His Pro Pro Ser His Trp Pro Leu Ile Lys Ala Thr Val Gly					
	500		505		510
Leu Ile Arg Asn Leu Ala Leu Cys Pro Ala Asn His Ala Pro Leu Arg					
	515		520		525
Glu Gln Gly Ala Ile Pro Arg Leu Val Gln Leu Leu Val Arg Ala His					
	530		535		540
Gln Asp Thr Gln Arg Arg Thr Ser Met Gly Gly Thr Gln Gln Gln Phe					
545		550		555	560
Val Glu Gly Val Arg Met Glu Glu Ile Val Glu Gly Cys Thr Gly Ala					
	565		570		575
Leu His Ile Leu Ala Arg Asp Val His Asn Arg Ile Val Ile Arg Gly					
	580		585		590
Leu Asn Thr Ile Pro Leu Phe Val Gln Leu Leu Tyr Ser Pro Ile Glu					
	595		600		605
Asn Ile Gln Arg Val Ala Ala Gly Val Leu Cys Glu Leu Ala Gln Asp					
	610		615		620
Lys Glu Ala Ala Glu Ala Ile Glu Ala Glu Gly Ala Thr Ala Pro Leu					
625		630		635	640
Thr Glu Leu Leu His Ser Arg Asn Glu Gly Val Ala Thr Tyr Ala Ala					
	645		650		655
Ala Val Leu Phe Arg Met Ser Glu Asp Lys Pro Gln Asp Tyr Lys Lys					
	660		665		670
Arg Leu Ser Val Glu Leu Thr Ser Ser Leu Phe Arg Thr Glu Pro Met					
	675		680		685
Ala Trp Asn Glu Thr Ala Asp Leu Gly Leu Asp Ile Gly Ala Gln Gly					
	690		695		700
Glu Pro Leu Gly Tyr Arg Gln Asp Asp Pro Ser Tyr Arg Ser Phe His					
705		710		715	720
Ser Gly Gly Tyr Gly Gln Asp Ala Leu Gly Met Asp Pro Met Met Glu					
	725		730		735
His Glu Met Gly Gly His His Pro Gly Ala Asp Tyr Pro Val Asp Gly					

740	745	750
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Val Gln Gln Pro Ser Ala Phe Gly Ser Met Lys Val Ser Arg Asp Lys		
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	35	40 45
Asp Arg Pro Gln Glu Val Ser Tyr Thr Asp Thr Lys Val Ile Gly Asn		
	50	55 60
Gly Ser Phe Gly Val Val Tyr Gln Ala Lys Leu Cys Asp Ser Gly Glu		
65	70	75 80
Leu Val Ala Ile Lys Lys Val Leu Gln Asp Lys Arg Phe Lys Asn Arg		
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Glu Leu Gln Ile Met Arg Lys Leu Asp His Cys Asn Ile Val Arg Leu		
	100	105 110
Arg Tyr Phe Phe Tyr Ser Ser Gly Glu Lys Lys Asp Glu Val Tyr Leu		
	115	120 125
Asn Leu Val Leu Asp Tyr Val Pro Glu Thr Val Tyr Arg Val Ala Arg		
	130	135 140
His Tyr Ser Arg Ala Lys Gln Thr Leu Pro Val Ile Tyr Val Lys Leu		
145	150	155 160
Tyr Met Tyr Gln Leu Phe Arg Ser Leu Ala Tyr Ile His Ser Phe Gly		
	165	170 175
Ile Cys His Arg Asp Ile Lys Pro Gln Asn Leu Leu Leu Asp Pro Asp		
	180	185 190
Thr Ala Val Leu Lys Leu Cys Asp Phe Gly Ser Ala Lys Gln Leu Val		
	195	200 205
Arg Gly Glu Pro Asn Val Ser Tyr Ile Cys Ser Arg Tyr Tyr Arg Ala		
210	215	220

Pro Glu Leu Ile Phe Gly Ala Thr Asp Tyr Thr Ser Ser Ile Asp Val
225 230 235 240

Trp Ser Ala Gly Cys Val Leu Ala Glu Leu Leu Leu Gly Gln Pro Ile
245 250 255

Phe Pro Gly Asp Ser Gly Val Asp Gln Leu Val Glu Ile Ile Lys Val
260 265 270

Leu Gly Thr Pro Thr Arg Glu Gln Ile Arg Glu Met Asn Pro Asn Tyr
275 280 285

Thr Glu Phe Lys Phe Pro Gln Ile Lys Ala His Pro Trp Thr Lys Val
290 295 300

Phe Arg Pro Arg Thr Pro Pro Glu Ala Ile Ala Leu Cys Ser Arg Leu
305 310 315 320

Leu Glu Tyr Thr Pro Thr Ala Arg Leu Thr Pro Leu Glu Ala Cys Ala
325 330 335

His Ser Phe Phe Asp Glu Leu Arg Asp Pro Asn Val Lys Leu Pro Asn
340 345 350

Gly Arg Asp Thr Pro Ala Leu Phe Asn Phe Thr Thr Gln Glu Leu Ser
355 360 365

Ser Asn Pro Pro Leu Ala Thr Ile Leu Ile Pro Pro His Ala Arg Ile
370 375 380

Gln Ala Ala Ala Ser Thr Pro Thr Asn Ala Thr Ala Ala Ser Asp Ala
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Asn Thr Gly Asp Arg Gly Gln Thr Asn Asn Ala Ala Ser Ala Ser Ala
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Ser Asn Ser Thr
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<210> 3

<211> 648

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<213> Homo sapiens

<400> 3

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Ala Ser Trp Glu Leu Cys Ala Gly Ala Leu Ser Ala Arg Leu Ala Glu
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Glu Gly Ser Gly Asp Ala Gly Gly Arg Arg Arg Pro Pro Val Asp Pro
35 40 45

Arg Arg Leu Ala Arg Gln Leu Leu Leu Leu Leu Trp Leu Leu Glu Ala
50 55 60

Pro	Leu	Leu	Leu	Gly	Val	Arg	Ala	Gln	Ala	Ala	Gly	Gln	Gly	Pro	Gly	65	70	75	80
Gln	Gly	Pro	Gly	Pro	Gly	Gln	Gln	Pro	Pro	Pro	Pro	Pro	Pro	Gln	Gln	85	90	95	
Gln	Gln	Ser	Gly	Gln	Gln	Tyr	Asn	Gly	Glu	Arg	Gly	Ile	Ser	Val	Pro	100	105	110	
Asp	His	Gly	Tyr	Cys	Gln	Pro	Ile	Ser	Ile	Pro	Leu	Cys	Thr	Asp	Ile	115	120	125	
Ala	Tyr	Asn	Gln	Thr	Ile	Met	Pro	Asn	Leu	Leu	Gly	His	Thr	Asn	Gln	130	135	140	
Glu	Asp	Ala	Gly	Leu	Glu	Val	His	Gln	Phe	Tyr	Pro	Leu	Val	Lys	Val	145	150	155	160
Gln	Cys	Ser	Ala	Glu	Leu	Lys	Phe	Phe	Leu	Cys	Ser	Met	Tyr	Ala	Pro	165	170	175	
Val	Cys	Thr	Val	Leu	Glu	Gln	Ala	Leu	Pro	Pro	Cys	Arg	Ser	Leu	Cys	180	185	190	
Glu	Arg	Ala	Arg	Gln	Gly	Cys	Glu	Ala	Leu	Met	Asn	Lys	Phe	Gly	Phe	195	200	205	
Gln	Trp	Pro	Asp	Thr	Leu	Lys	Cys	Glu	Lys	Phe	Pro	Val	His	Gly	Ala	210	215	220	
Gly	Glu	Leu	Cys	Val	Gly	Gln	Asn	Thr	Ser	Asp	Lys	Gly	Thr	Pro	Thr	225	230	235	240
Pro	Ser	Leu	Leu	Pro	Glu	Phe	Trp	Thr	Ser	Asn	Pro	Gln	His	Gly	Gly	245	250	255	
Gly	Gly	His	Arg	Gly	Gly	Phe	Pro	Gly	Gly	Ala	Gly	Ala	Ser	Glu	Arg	260	265	270	
Gly	Lys	Phe	Ser	Cys	Pro	Arg	Ala	Leu	Lys	Val	Pro	Ser	Tyr	Leu	Asn	275	280	285	
Tyr	His	Phe	Leu	Gly	Glu	Lys	Asp	Cys	Gly	Ala	Pro	Cys	Glu	Pro	Thr	290	295	300	
Lys	Val	Tyr	Gly	Leu	Met	Tyr	Phe	Gly	Pro	Glu	Glu	Leu	Arg	Phe	Ser	305	310	315	320
Arg	Thr	Trp	Ile	Gly	Ile	Trp	Ser	Val	Leu	Cys	Cys	Ala	Ser	Thr	Leu	325	330	335	
Phe	Thr	Val	Leu	Thr	Tyr	Leu	Val	Asp	Met	Arg	Arg	Phe	Ser	Tyr	Pro	340	345	350	
Glu	Arg	Pro	Ile	Ile	Phe	Leu	Ser	Gly	Cys	Tyr	Thr	Ala	Val	Ala	Val	355	360	365	

Ala Tyr Ile Ala Gly Phe Leu Leu Glu Asp Arg Val Val Cys Asn Asp
 370 375 380

Lys Phe Ala Glu Asp Gly Ala Arg Thr Val Ala Gln Gly Thr Lys Lys
 385 390 395 400

Glu Gly Cys Thr Ile Leu Phe Met Met Leu Tyr Phe Phe Ser Met Ala
 405 410 415

Ser Ser Ile Trp Trp Val Ile Leu Ser Leu Thr Trp Phe Leu Ala Ala
 420 425 430

Gly Met Lys Trp Gly His Glu Ala Ile Glu Ala Asn Ser Gln Tyr Phe
 435 440 445

His Leu Ala Ala Trp Ala Val Pro Ala Ile Lys Thr Ile Thr Ile Leu
 450 455 460

Ala Leu Gly Gln Val Asp Gly Asp Val Leu Ser Gly Val Cys Phe Val
 465 470 475 480

Gly Leu Asn Asn Val Asp Ala Leu Arg Gly Phe Val Leu Ala Pro Leu
 485 490 495

Phe Val Tyr Leu Phe Ile Gly Thr Ser Phe Leu Leu Ala Gly Phe Val
 500 505 510

Ser Leu Phe Arg Ile Arg Thr Ile Met Lys His Asp Gly Thr Lys Thr
 515 520 525

Glu Lys Leu Glu Lys Leu Met Val Arg Ile Gly Val Phe Ser Val Leu
 530 535 540

Tyr Thr Val Pro Ala Thr Ile Val Ile Ala Cys Tyr Phe Tyr Glu Gln
 545 550 555 560

Ala Phe Arg Asp Gln Trp Glu Arg Ser Trp Val Ala Gln Ser Cys Lys
 565 570 575

Ser Tyr Ala Ile Pro Cys Pro His Leu Gln Ala Gly Gly Gly Ala Pro
 580 585 590

Pro His Pro Pro Met Ser Pro Asp Phe Thr Val Phe Met Ile Lys Tyr
 595 600 605

Leu Met Thr Leu Ile Val Gly Ile Thr Ser Gly Phe Trp Ile Trp Ser
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Gly Lys Thr Leu Asn Ser Trp Arg Lys Phe Tyr Thr Arg Leu Thr Asn
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Ser Lys Gln Gly Glu Thr Thr Val
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<211> 565

<212> PRT

<213> Homo sapiens

<400> 4

Met Arg Pro Arg Ser Ala Leu Pro Arg Leu Leu Leu Pro Leu Leu Leu
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Leu Pro Ala Ala Gly Pro Ala Gln Phe His Gly Glu Lys Gly Ile Ser
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Ile Pro Asp His Gly Phe Cys Gln Pro Ile Ser Ile Pro Leu Cys Thr
35 40 45

Asp Ile Ala Tyr Asn Gln Thr Ile Met Pro Asn Leu Leu Gly His Thr
50 55 60

Asn Gln Glu Asp Ala Gly Leu Glu Val His Gln Phe Tyr Pro Leu Val
65 70 75 80

Lys Val Gln Cys Ser Pro Glu Leu Arg Phe Phe Leu Cys Ser Met Tyr
85 90 95

Ala Pro Val Cys Thr Val Leu Glu Gln Ala Ile Pro Pro Cys Arg Ser
100 105 110

Ile Cys Glu Arg Ala Arg Gln Gly Cys Glu Ala Leu Met Asn Lys Phe
115 120 125

Gly Phe Gln Trp Pro Glu Arg Leu Arg Cys Glu His Phe Pro Arg His
130 135 140

Gly Ala Glu Gln Ile Cys Val Gly Gln Asn His Ser Glu Asp Gly Ala
145 150 155 160

Pro Ala Leu Leu Thr Thr Ala Pro Pro Pro Gly Leu Gln Pro Gly Ala
165 170 175

Gly Gly Thr Pro Gly Gly Pro Gly Gly Gly Gly Ala Pro Pro Arg Tyr
180